

WHAT IS CLAIMED:

- 1 1. A Global Positioning System (GPS) receiver comprising:
2 a first section having a signal acquisition stage for acquiring an input signal
3 and a sampling stage for sampling the input signal at a sampling data rate to provide sampled
4 data; and
5 a second section having an I/O data buffer for receiving and buffering the
6 sampled data and providing the buffered data to tracker hardware, wherein the tracker
7 hardware operates at an operational rate which is greater than the sampling data rate of the
8 input signal enabling multiple cycling of the buffered data by the I/O data buffer.
- 1 2. The GPS receiver according to Claim 1, wherein the tracker hardware is single
2 channel receiver hardware behaving as multi-channel receiver hardware.
- 1 3. The GPS receiver according to Claim 1, wherein the tracker hardware includes
2 a plurality of Field Programmable Gate Arrays for operating the tracker hardware at the
3 operational rate.
- 1 4. The GPS receiver according to Claim 1, wherein the sampling data rate is
2 approximately 2 MHz and the operational rate is approximately 50 MHz.
- 1 5. The GPS receiver according to Claim 1, further comprising a first processor for
2 at least performing navigation functions and controlling the tracker hardware, and a second
3 processor for at least performing tracking functions, wherein the first and second processors
4 are interfaced by interface hardware.
- 1 6. The GPS receiver according to Claim 5, wherein the interface hardware is a
2 dual-port memory.
- 1 7. The GPS receiver according to Claim 5, further comprising an external
2 interface connected to the first processor for at least uploading software to the first processor.
- 1 8. The GPS receiver according to Claim 5, wherein the second processor provides
2 data associated with a tracking state vector to the tracker hardware and controls the I/O data
3 buffer to stream at least a portion of the sampled data to the tracker hardware for processing.

1 9. The GPS receiver according to Claim 8, wherein the second processor
2 processes data outputted by the tracker hardware from processing a previous data stream
3 while the tracker hardware processes the at least the portion of the sampled data.

1 10. The GPS receiver according to Claim 5, wherein the tracking and navigation
2 functions are performed simultaneously.

1 11. The GPS receiver according to Claim 1, wherein the sampled data provided by
2 the first section includes Inphase and Quadrature sampled data, and wherein the first section
3 further provides a sampling clock to the second section.

1 12. The GPS receiver according to Claim 1, wherein the I/O data buffer provides
2 the sampled data to the tracker hardware in batches to provide for batch-mode processing of
3 the sampled data.

1 13. The GPS receiver according to Claim 1, wherein the signal acquisition stage
2 includes a down-converter filter and a Low Noise Amplifier (LNA) connected to an antenna
3 for acquiring the input signal.

1 14. A method for processing an input signal received by a Global Positioning
2 System (GPS) receiver, the method comprising the steps of:
3 sampling the input signal at a sampling data rate to provide sampled data;
4 buffering the sampled data by a data buffer; and
5 providing the buffered data to tracker hardware operating at an operational rate
6 which is greater than the sampling data rate, thereby causing cycling of the buffered data
7 through the data buffer a plurality of times.

1 15. The method according to Claim 14, wherein the tracker hardware is single
2 channel receiver hardware behaving as multi-channel receiver hardware.

1 16. The method according to Claim 14, wherein the tracker hardware includes a
2 plurality of Field Programmable Gate Arrays for operating the tracker hardware at the
3 operational rate.

1 17. The method according to Claim 14, wherein the sampling data rate is
2 approximately 2 MHz and the operational rate is approximately 50 MHz.

1 18. The method according to Claim 14, wherein the data buffer provides the
2 sampled data to the tracker hardware in batches to provide for batch-mode processing of the
3 sampled data.

1 19. A Global Positioning System (GPS) receiver comprising:
2 a first section having a signal acquisition stage for acquiring an input signal
3 and a sampling stage for sampling the input signal at a sampling data rate to provide sampled
4 data; and
5 a second section having an I/O data buffer for receiving and buffering the
6 sampled data and providing the buffered data to tracker hardware in batches to be processed
7 by the tracker hardware by batch-mode processing.

1 20. The GPS receiver according to Claim 19, wherein the tracker hardware is
2 single channel receiver hardware behaving as multi-channel receiver hardware.

1 21. The GPS receiver according to Claim 19, wherein the tracker hardware
2 includes a plurality of Field Programmable Gate Arrays.

1 22. The GPS receiver according to Claim 19, wherein the sampling data rate is
2 approximately 2 MHz, and wherein an operational rate of the tracker hardware is
3 approximately 50 MHz.

1 23. The GPS receiver according to Claim 19, further comprising a first processor
2 for at least performing navigation functions and controlling the tracker hardware, and a
3 second processor for at least performing tracking functions.

1 24. The GPS receiver according to Claim 23, wherein the second processor
2 provides data associated with a tracking state vector to the tracker hardware and controls the
3 I/O data buffer to stream at least a portion of the sampled data to the tracker hardware for
4 processing.

1 25. The GPS receiver according to Claim 24, wherein the second processor
2 processes data outputted by the tracker hardware from processing a previous data stream
3 while the tracker hardware processes the at least the portion of the sampled data.

1 26. The GPS receiver according to Claim 23, wherein the tracking and navigation
2 functions are performed simultaneously.

1 27. The GPS receiver according to Claim 19, wherein the sampled data provided
2 by the first section includes Inphase and Quadrature sampled data, and wherein the first
3 section further provides a sampling clock to the second section.

1 28. The GPS receiver according to Claim 19, wherein the signal acquisition stage
2 includes a down-converter filter and a Low Noise Amplifier (LNA) connected to an antenna
3 for acquiring the input signal.

1 29. A method for processing an input signal received by a Global Positioning
2 System (GPS) receiver, the method comprising the steps of:

3 sampling the input signal at a sampling data rate to provide sampled data;

4 buffering the sampled data by a data buffer; and

5 providing the buffered data to tracker hardware in batches to be processed by
6 the tracker hardware by batch-mode processing.

1 30. The method according to Claim 29, wherein the tracker hardware is single
2 channel receiver hardware behaving as multi-channel receiver hardware.

1 31. The method according to Claim 29, wherein the tracker hardware includes a
2 plurality of Field Programmable Gate Arrays.

1 32. The method according to Claim 29, wherein the sampling data rate is
2 approximately 2 MHz, and wherein an operational rate of the tracker hardware is
3 approximately 50 MHz.